

THE REMARKS

Claims 60-80 are new. Claims 1-59 have been cancelled.

The objections noted at page 2 of the Office Action have been corrected in the new claims.

Overview of The New Claims

Claims 60-72 are directed to a packet marker for selectively updating one or more quality of service (QoS) fields of a packet. The packet marker operates within a packet modification system for receiving packets from one or more switch-side devices, which packets have been previously classified by a packet classification system, modifying the packets, and transmitting the modified packets to one or more network-side devices. The packet marker selectively updates the one or more QoS fields of a modified packet prior to egress thereof from the packet modification system. Claims 73-80 are directed to a related method.

Claims 60, 68 and 73 are independent. Claims 61-67 depend, directly or indirectly, from claim 60. Claims 69-72 depend, directly or indirectly, from claim 68. Claims 74-80 depend, directly or indirectly, from claim 73.

For purposes of explaining the claims, the following discussion focuses on claim 60, which, for purposes of discussion, can be considered to be representative.

The preamble of claim 60, reproduced below, recites the specific context or environment in which the packet marker operates, *i.e.*, in a packet modification system that receives packets from one or more switch-side devices, which packets have been previously classified by a packet classification system, modifies the packets, and transmits the modified packets to one or more network-side devices, and also recites that the packet market selectively updates one or more QoS fields of a modified packet, prior to egress thereof from the packet modification system:

“In a packet modification system for receiving packets, previously classified by a packet classification system, from one or more switch-side devices, modifying the packets to facilitate egress thereof from the packet modification system, and transmitting the modified packets to one or more network-side devices, a packet marker for selectively updating one or more quality of service (QoS) fields in such a modified packet, prior to egress thereof from the packet modification system, comprising:”

Such is supported, for example, by Fig. 2 and related text at page 11, lines 26-27, illustrating and describing a packet processing system comprising receive components 112a and transmission components 112b of a packet addressor 112, Fig. 6, and related text at page 48, line 27, to page 51, line 22, indicating that receive components 112a perform a packet classification function, and Col. 4, lines 40-42 of USP 7,292,591 (hereinafter “the ‘591 patent”), filed Mar. 30, 1994 as USSN 10/814,725, incorporated by reference on pages 1-2, characterizing receive components 112a as a packet classification system, Fig. 7, and related text at page 51, line 51, to page 65, line 16, indicating that transmission components 112b perform a packet modification function, and Col. 4, lines 40-42 of the incorporated-by-reference ‘591 patent, characterizing the transmission components 112b as a packet modification system, which packet modification system receives packets from one or more switch-side devices, modifies the packets, and transmits the packets to one or more network-side devices, *see* Col. 4, lines 50-55 of the incorporated-by-reference ‘591 patent, which packets have been previously classified by the packet classification system, *see* Col. 4, lines 60-66 of the incorporated-by-reference ‘591 patent, and which packet modification system further includes a packet marker, identified with numeral 232 in Fig. 1, that performs the recited function and bears the recited relationships to the packet modification and classification systems, *see, e.g.*, page 23, lines 8-11.

The first paragraph recites that the packet marker comprises one or more memories for holding certain data structures, data values, and commands, *i.e.*, a lookup table, values of the one or more QoS fields taken from the packet prior to modification thereof by the packet modification system, possible values of one or more of such fields independent of the table, as well as egress mark commands:

“one or more memories for holding (1) a table associating possible values of the one or more of the QoS fields of the packet with an index, (2) values of the one or more QoS fields taken from the packet prior to modification thereof by the packet modification system, (3) possible values of the one or more of the QoS fields independent of the table, and (4) one or more egress mark commands; and”

Such is supported, for example, by page 62, lines 24-30, describing a lookup table stored in transmit state tables RAMs 232c containing possible values of VLAN VPRI, MPLS EXP, and IPv4/IPv6 ToS fields, page 64, lines 12-15, describing values of the VLAN VPRI, MPLS EXP and IPv4/IPv6 ToS fields, taken from the packet prior to modification thereof by the packet

modification system, being stored in transmit post processor RAM 232b, page 64, lines 22-23, describing possible values of one or more of the fields being stored in modification RAM 246a independent of the lookup table, page 63, lines 5-6, describing a transmit modification recipe, containing one or more egress mark control commands, and page 55, line 25, to page 57, line 16, describing internal recipe RAM 710 and/or external transmit modification RAM 246a for the storage of transmit modification recipes.

The second paragraph recites a packet marker processor for utilizing a link associated with the packet by the packet classification system to access the egress mark commands stored in the one or more memories, and executing such commands to selectively update the one or more QoS fields in the packet:

“a packet marker processor for utilizing a link associated with the packet by the packet classification system to access the one or more egress mark commands stored in the one or more memories, and executing such commands to selectively update the one or more QoS fields of the modified packet;”

Such is supported, for example, page 54, line 22, to page 55, line 23, referring to a TXMI pointer, associated with the packet by the packet classification system, pointing to a link that is used in turn to access a transmit modification recipe, *see* page 63, lines 5-6, which recipe would include the one or more egress mark commands, and page 64, line 16, to page 65, line 16, describing packet market processor 232a executing the egress mark commands to selectively update the one or more QoS fields of the packet.

The third paragraph recites that the packet market processor, upon executing the commands, individually selects, for each of the one or more QoS fields of the packet, the process used for updating the field from amongst at least three specific processes:

“wherein the packet maker processor, upon executing these commands, individually selects, for each of the one or more QoS fields, the process used for updating the field from amongst at least the following processes:

updating the field using the value of the field taken from the packet prior to modification thereof by the packet modification system as stored in the one or more memories;

updating the field using a value obtained by performing a table lookup operation on the table stored in the one or more memories, using as an index in said operation a

value obtained or derived from information associated with the packet by the packet classification system; and

updating the field with one of the values stored in the one or more memories independent of the table.”

Such is supported, for example, by page 64, lines 16-25, describing egress mark commands for individually modifying VLAN VPRI, MPLS EXP and IPv4/IPv6 ToS QoS fields using any of the three recited processes.

The same or similar recitations are also set forth in independent claims 68 and 73. Therefore, these claims are also supported by the citations set forth above.

Regarding the dependent claims, exemplary support for these claims is as follows:

1. Claims 61, 62, 74, 75 – page 64, lines 5-11, referring to a packet having VLAN VPRI, MPLS EXP and IPv4/IPv6 ToS QoS fields.
2. Claims 63, 65, 69, 76, 78 – page 62, lines 26-28, referring to embodiment of egress mark control information as comprising Egress Mark Select (EMS) and Egress Mark Mask (EMM) bits, and page 63, lines 19-21, referring to EMS portion being used as index to lookup table.
3. Claims 64, 72, 77 – page 64, lines 24-26, referring to QNUM (queue number associated with packet by packet classification system) being used as index to lookup table.
4. Claims 66, 67, 70, 71, 79, 80 – page 63, lines 17-19, with the EMM portion of one embodiment of the egress mark control information having three bits, with each bit individually controlling whether updating of the VLAN VPRI, MPLS EXP and IPv4/IPv6 ToS fields, respectively, is allowed to occur or not.

No new matter is introduced in any of the above amendments. The Examiner is requested to enter the amendment and re-consider the application.

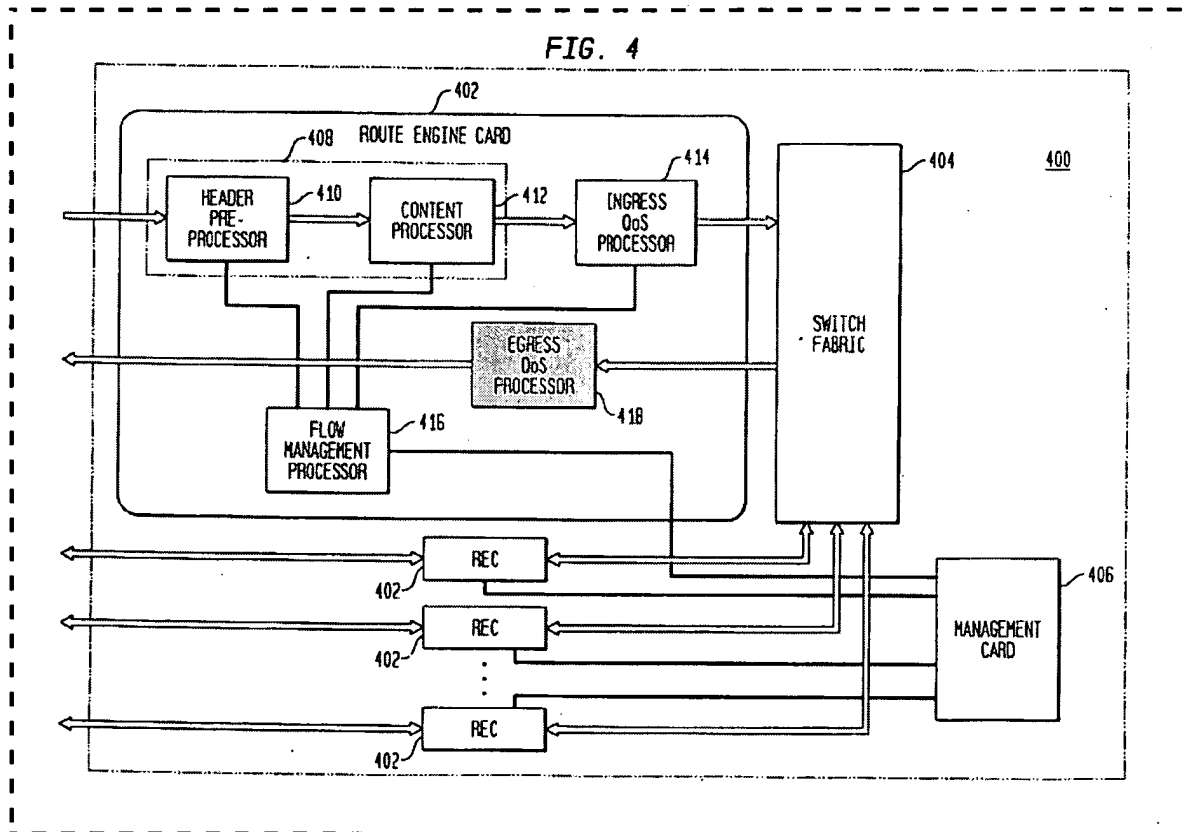
35 U.S.C. 102(b), 103(a) Rejections

Cancelled claims 1-59 stand rejected based primarily on Maher, III et al. (U.S. 6,381,242 B1, hereinafter “Maher”) and Alam (U.S. 7,340,535 B1, hereinafter “Alam”), with Wakayama, et al. (U.S. 2006/0034292 A1, hereinafter “Wakayama”), Lee (U.S. 2003/0126286 A1, hereinafter “Lee”), Valenci (U.S. 2003/0185220 A1, hereinafter “Valenci”), West, et al. (U.S.

7,006,438 B2, hereinafter "West"), Natarajan, et al. (U.S. 2005/0149633 A1, hereinafter "Natarajan"), and Colley, et al. (U.S. 6,650,644 B1, hereinafter "Colley") serving as secondary references. However, as claims 1-59 have been cancelled, Applicant believes that each of these rejections is now moot

Moreover, as new claims 60-80 patentably distinguish over each of these references, considered singly or in combination, these claims are now allowable. To see this, consider Maher, the sole or base reference in all the rejections, as applied to claim 60.

The only component of Maher that is even arguably relevant to the requirements of claim 60 is egress QoS processor 418, shown in Fig. 4, reproduced below:



The basis for this conclusion is that egress QoS processor 418 is the only component described in Maher that is situated, as required by the preamble of claim 60, between one or more switch-side devices (represented by switch fabric 404) on the right and one or more network-side devices on the left (not shown):

"In a packet modification system for receiving packets, previously classified by a packet classification system, from one or more switch-side devices, modifying the packets to facilitate

egress thereof from the packet modification system, and transmitting the modified packets to one or more network-side devices, a packet marker for selectively updating one or more quality of service (QoS) fields in such a modified packet, prior to egress thereof from the packet modification system, comprising:

Route engine card 402, and the components thereof (traffic flow scanning engine 408, ingress QoS processor 414, and flow management processor 416), are not relevant because they are all contained on the other side of the switch fabric 404.

However, egress QoS processor 418 fails to meet any of the remaining requirements of claim 60. In particular, as the following passage indicates, egress QoS processor 418 merely schedules the traffic received from all the route engine cards 402, without updating or modifying the QoS fields of previously modified packets in any way:

assigned output port. The data packet then flows through the egress QoS processor 418, which schedules the traffic received from all the route engine cards 402 for transmission onto the network. The microprocessor 124 shown in FIG. 2

(Col. 11, lines 17-20).

Therefore, it does not meet the other requirements of the preamble of claim 60, reproduced below, that the packet marker be part of a packet modification system, and that the packet marker selectively update one or more QoS fields of the modified packets as generated by the packet modification system:

“In a packet modification system for receiving packets, previously classified by a packet classification system, from one or more switch-side devices, modifying the packets to facilitate egress thereof from the packet modification system, and transmitting the modified packets to one or more network-side devices, a packet marker for selectively updating one or more quality of service (QoS) fields in such a modified packet, prior to egress thereof from the packet modification system, comprising:” (Emphasis added).

Nor does it meet any of the requirements of the claim body. In particular, it does not have the one or more memories holding the specific table, values and commands recited in the first paragraph:

“one or more memories for holding (1) a table associating possible values of the one or more of the QoS fields of the packet with an index, (2) values of the one or more QoS fields taken from the packet prior to modification thereof by the packet modification system, (3) possible values of the one or more of the QoS fields independent of the table, and (4) one or more egress mark commands; and”

Nor does it execute egress mark commands to selectively update the one or more QoS fields in a packet, as required by the second paragraph:

“a packet marker processor for utilizing a link associated with the packet by the packet classification system to access the one or more egress mark commands stored in the one or more memories, and executing such commands to selectively update the one or more QoS fields of the modified packet;”

Nor does it individually select, from at least three specific processes, the process used for updating each of the one or more QoS fields of the modified packet, as required by the third paragraph:

“wherein the packet maker processor, upon executing these commands, individually selects, for each of the one or more QoS fields, the process used for updating the field from amongst at least the following processes:

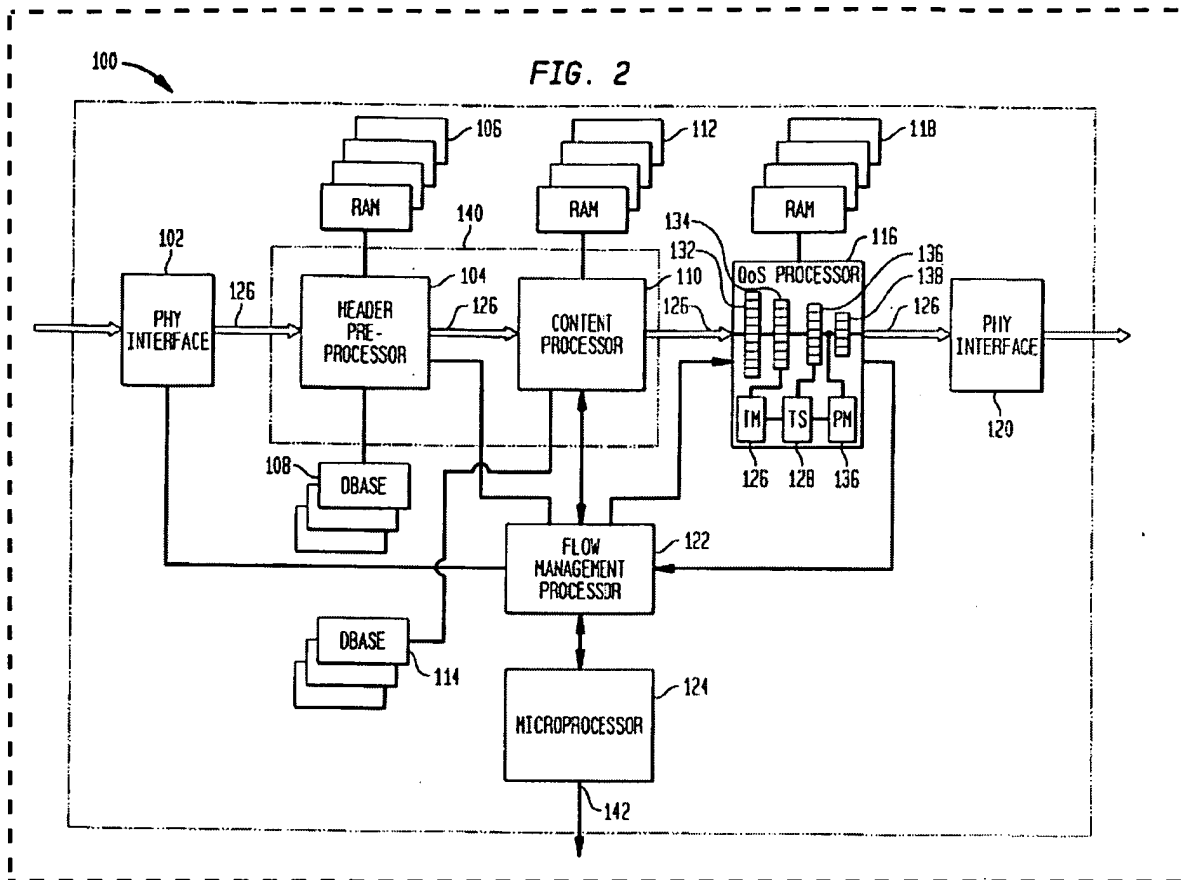
updating the field using the value of the field taken from the packet prior to modification thereof by the packet modification system as stored in the one or more memories;

updating the field using a value obtained by performing a table lookup operation on the table stored in the one or more memories, using as an index in said operation a value obtained or derived from information associated with the packet by the packet classification system; and

updating the field with one of the values stored in the one or more memories independent of the table.”

Therefore, egress QoS processor 418 shown in Fig. 4 of Maher falls far short of meeting the requirements of new claim 60.

Nor does QoS processor 116, shown in Fig. 2 of Maher, reproduced below, which is featured in the Office Action, meet the requirements of claim 60:



In particular, since QoS processor 116 is part of a single blade network apparatus, (*see* Col. 3, lines 45-46), it lacks the switch fabric 404 shown in Fig. 4, but instead merely receives and transmits to/from the network, as indicated by the following passage:

Network apparatus 100, as shown, accepts data received from a high-speed network line or lines, processes the data, and then places the data back on a line or lines. Network

(Col. 5, lines 44-46).

Accordingly, it does not fulfill the requirement, expressed in the preamble, that the claimed packet marker be part of a packet modification system that receives packets from one or more switch-side devices:

“In a packet modification system for receiving packets, previously classified by a packet classification system, from one or more switch-side devices, modifying the packets to facilitate egress thereof from the packet modification system, and transmitting the modified packets to one or more network-side devices, a packet marker for selectively updating one or more quality of

service (QoS) fields in such a modified packet, prior to egress thereof from the packet modification system, comprising:" (Emphasis added).

Nor does it meet any of the other requirements of claim 60, in particular, the requirement of the preamble that the packet marker selectively update one or more QoS fields in a packet transmitted over the network:

"In a packet modification system for receiving packets, previously classified by a packet classification system, from one or more switch-side devices, modifying the packets to facilitate egress thereof from the packet modification system, and transmitting the modified packets to one or more network-side devices, a packet marker for selectively updating one or more quality of service (QoS) fields in such a modified packet, prior to egress thereof from the packet modification system, comprising:" (Emphasis added).

None of the parameters or values that are alleged in the Office Action as being modified even qualify as packet fields. For example, as Maher itself indicates, the OC-3, OC-12, and OC-45 parameters alleged in the Office Action are network speeds, Col. 5, lines 11-12, 40-41, rather than QoS fields in a packet that is transmitted over the network.

Furthermore, none of the header modifications referenced in the Office Action are to the QoS fields of a packet. For example, the following passage from Maher only refers in general to packet header modifications by a packet modification engine 130 in QoS processor 116, but fails to suggest the specific modifications of QoS packet fields required by the claims:

QoS processor 116 also includes packet modification engine 130, which is operable to modify, add, or delete bits in any of the fields of a data packet. This allows QoS processor 116 to change addresses for routing or to place the appropriate headers on the data packets for the required protocol. The packet modification engine 130 can also be used to change information within the payload itself if necessary. Data packets are then sent along fast-data path

(Col. 7, line 64, to Col. 8, line 2).

QoS processor 116 also lacks the one or more memories holding the specific table, values and commands required by the first paragraph in the body of claim 60:

"one or more memories for holding (1) a table associating possible values of the one or more of the QoS fields of the packet with an index, (2) values of the one or more QoS fields taken from the packet prior to modification thereof by the packet modification system, (3) possible values of the one or more of the QoS fields independent of the table, and (4) one or more egress mark commands; and"

It also does not utilize a link previously associated with the packet by the packet classification system to access the egress mark commands stored in the one or more memories, or execute such commands to selectively update the one or more QoS fields in the packet, as required by the second paragraph:

“a packet marker processor for utilizing a link associated with the packet by the packet classification system to access the one or more egress mark commands stored in the one or more memories, and executing such commands to selectively update the one or more QoS fields of the modified packet;”

It also fails to individually select, for each of the one or more QoS fields of the packet, the process used for updating the field from amongst at least three specific processes, as required by the third paragraph:

“wherein the packet maker processor, upon executing these commands, individually selects, for each of the one or more QoS fields, the process used for updating the field from amongst at least the following processes:

updating the field using the value of the field taken from the packet prior to modification thereof by the packet modification system as stored in the one or more memories;

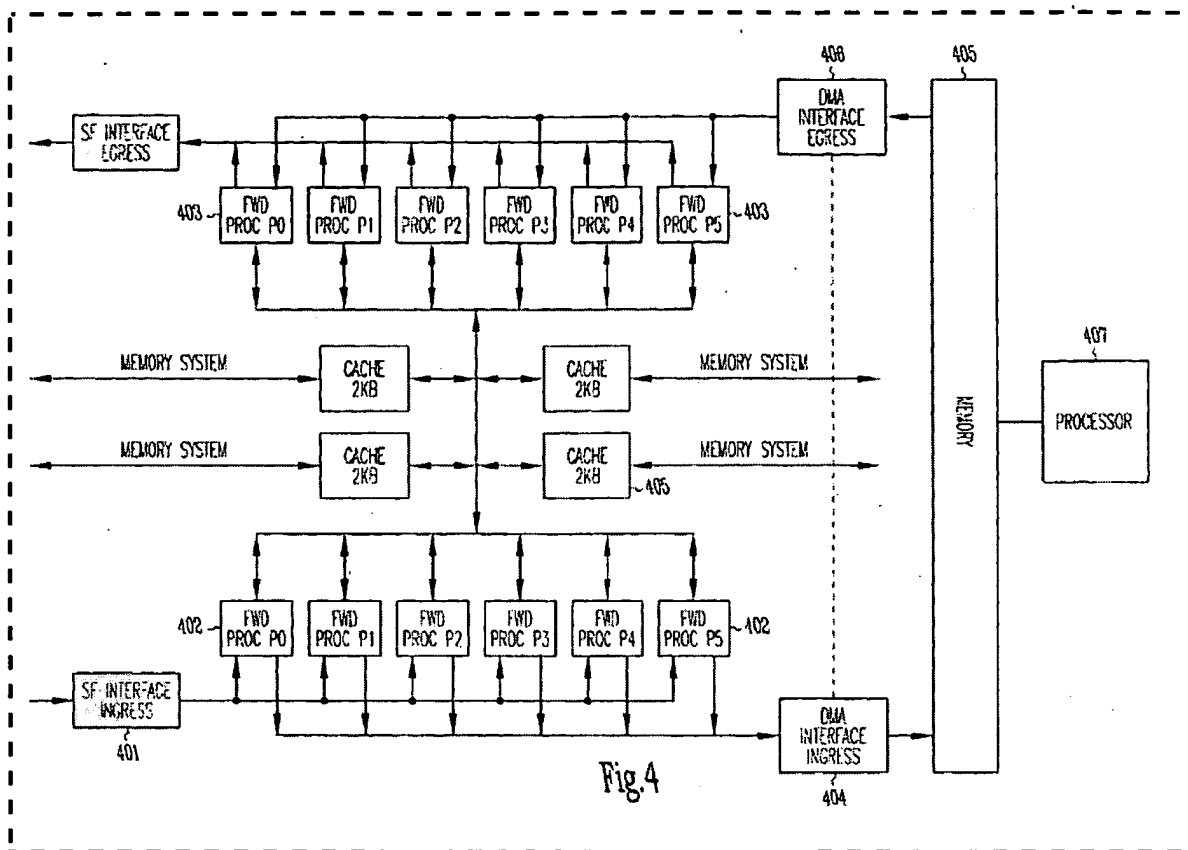
updating the field using a value obtained by performing a table lookup operation on the table stored in the one or more memories, using as an index in said operation a value obtained or derived from information associated with the packet by the packet classification system; and

updating the field with one of the values stored in the one or more memories independent of the table.”

In view of the foregoing deficiencies, it is respectfully that Maher cannot support any rejection of the new claims.

Turning to Alam, that reference is similarly deficient with respect to the requirements of the claims.

That reference features a packet forwarding engine (PFE), shown in Fig. 4, reproduced below, that both receives packets from and transmits packets to the switch fabric (SF) (through SF interface ingress 401 and SF interface egress, both of which are highlighted):



Since the PFE both receives packets from and transmits packets to the switch fabric, it does not meet the requirement of the claim preamble, that the packet marker be part of a packet modification system that receives packets from one or more switch-side devices and transmits modified packets to one or more network-side devices:

"In a packet modification system for receiving packets, previously classified by a packet classification system, from one or more switch-side devices, modifying the packets to facilitate egress thereof from the packet modification system, and transmitting the modified packets to one or more network-side devices, a packet marker for selectively updating one or more quality of service (QoS) fields in such a modified packet, prior to egress thereof from the packet modification system, comprising:" (Emphasis added).

Moreover, the packet modifications performed by the PFE that are cited in the Office Action (a modification to a PRI field referenced at Col. 9, lines 12-15, a modification to an EXP field referenced at Col. 11, lines 45-49, and a modification to a ToS field referenced at Col. 9, lines 24-26) fail to meet the other requirements of claim 60.

In particular, as the following passage indicates, all these modifications are performed by the PFE using data, *i.e.*, bits and replacement values, stored in a transmit control block (TCB).

header data. Under the control of a Transform Control Block, the PFE egress unit can selectively replace and recompute specific fields in a small set of protocol headers.

(Col. 8, lines 65-67).

Nothing in Alam teaches or suggests using software, in the form of egress control commands, to control the packet field modifications as required by the second paragraph of claim 60:

“a packet marker processor for utilizing a link associated with the packet by the packet classification system to access the one or more egress mark commands stored in the one or more memories, and executing such commands to selectively update the one or more QoS fields of the modified packet;” (Emphasis added).

Moreover, as the following passage indicates, the PRI field is always updated using the same process, *i.e.*, replacing the field using a replacement value stored in the TCB when a corresponding bit, also stored in the TCB, is set:

The PFE uses the TCB HDRLEN field to update the SF header length field for outgoing packets. By default, the PFE retains the SF header RM (rate marking) and PRI (priority) fields from the incoming packet in the outgoing packet. When the associated TCB's ReplaceQOS field is set, the PFE replaces the incoming RM and PRI fields with the values set in the TCB's header block. The PFE also replaces

(Col. 9, lines 12-18).

Nothing in Alam teaches or suggests providing the flexibility to individually select for this field any of at least three specific processes for updating the field recited by the third paragraph:

“wherein the packet maker processor, upon executing these commands, individually selects, for each of the one or more QoS fields, the process used for updating the field from amongst at least the following processes:

updating the field using the value of the field taken from the packet prior to modification thereof by the packet modification system as stored in the one or more memories;

updating the field using a value obtained by performing a table lookup operation on the table stored in the one or more memories, using as an index in said operation a

value obtained or derived from information associated with the packet by the packet
classification system; and
updating the field with one of the values stored in the one or more memories
independent of the table.”

The same conclusion holds with respect to the modification of the ToS field referenced at Col. 9, lines 24-26. This modification always occurs using the same process, *i.e.*, replacing the field using a replacement value stored in the TCB if a corresponding bit in the TCB is also set. See Col. 7, lines 46-49. Again, nothing in Alam teaches or suggests providing the flexibility to individually select for this field any of the three specific processes for updating a QoS field recited in the third paragraph of claim 60.

The same conclusion holds with respect to the modification of the EXP field referenced at Col. 11, lines 45-49. This modification always occurs using the same process, *i.e.*, a reverse translation of an LQ header’s PRI and RM fields. *Id.* Again, nothing in Alam teaches or suggests providing the flexibility to individually select for this field any of at least three specific processes for updating a QoS field recited in the third paragraph of claim 60.

Nor is there any teaching or suggestion to combine Alam with Maher in the manner required by the new claims. For example, any attempt to incorporate the PFE of Alam into the egress QoS processor 418 shown in Fig. 4 of Maher is impermissible because such would have been contrary to the intent of Maher, that this processor merely “schedules the traffic received from all the route engine cards 402 for transmission onto the network,” *see* Maher, Col. 11, lines 18-20, without modifying the packets in any way. The MPEP recognizes that it is impermissible to combine references in support of an obviousness rejection that is contrary to the intent or principle of operation of the base reference. *See* MPEP 2143.01 (VI) (“If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.”).

For all the foregoing reasons, it is respectfully submitted that Alam cannot be relied on to support any rejection of the claims, alone or in combination with Maher.

Moreover, none of the other references cited in the Office Action, Wakayama, Lee, Valenci, West, Natarajan, and Colley, fill the gaps in teachings of Maher and Alam. Therefore, it is respectfully submitted that new claim 60 patentably distinguishes over each of these

references, considered singly or in combination. It is respectfully submitted that this conclusion also applies with respect to each of new claims 61-80, which incorporate the same or similar limitations as claim 60.

CONCLUSION

For all the foregoing reasons, Applicant believes that new claims 60-80 are allowable, and that the application is now in good and proper condition for allowance. Early notification of allowance is earnestly solicited.

Respectfully submitted,

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